

Rejections Under 35 U.S.C. § 102(b)

Claims 1-7, 9-11, 25, and 28 were rejected under 35 U.S.C. § 102(b) as being anticipated by Bortz (US 5,646,076). The Office Action asserts that Bortz teaches a friction controlling device made of a fiber reinforced polymer composite material produced by a nonwoven textile and a plastics industries material, the fibers within a 0.3cm – 8.0cm range and including aramid and glass fibers, polymeric resin binder or a blend of resin solutions impregnated in the product, the polymer including phenols, and the product including additional fillers such as powders (graphite) or additional fibers.

In addition, the Office Action asserts that Bortz (col. 11, ln. 38) teaches a fibrous form impregnated, saturated, sprayed, roller-applied, or otherwise compounded with an organic polymer material in solution, suspension, or gum, which means that both nonpolar and polar solvents are present, and hence held in “suspension.”

The Office Action asserts that this teaching anticipates the Applicants’ claimed invention. Furthermore, the Office Action alleges that the presence of a solvent is a method limitation and not present in the final product, and that it is the final product that is being claimed.

The Applicants respectfully traverse the rejection. First, amended Claim 1 recites a friction material comprising approximately 20% to 40% by weight a mat of non-woven fibres and approximately 40% to 60% by weight a thermosetting resin which impregnates the fibres.

In sharp contrast to the Applicant’s invention which claims with specificity the proportion of non-woven fibres and thermosetting resin that comprise the friction material, Bortz fails to provide such teaching. In an improvement over the prior art, the Applicant’s claimed invention provides a friction material that displays a remarkable stability while having a coefficient of friction that is at a level very close to that of paper-type friction materials. Bortz fails to teach or suggest a relation between the total weight of the non-woven fibre mat and the total weight of the impregnating thermosetting resin in terms of the total weight of the friction material.

Accordingly, the Applicants submit that the teaching of Bortz does not anticipate each and every limitation of amended Claim 1. Specifically, Applicants’ claimed invention provides a friction material defined by a specific relation between the weight of the non-woven fibre mat

and the weight of impregnating thermosetting resin comprising the total weight of the friction material. See Applicants' Specification at p. 7-8.

For the above stated reasons, amended Claim 1 is believed to distinguish patentably from Bortz. Accordingly, reconsideration and withdrawal of the rejection of claim 1 under Section 102 is respectfully requested.

As Claims 2-7, 9-11, 25, and 28 directly and indirectly depend from Claim 1, each of these claims is believed to be allowable over the prior art based on that dependency and the reasons stated above. In addition, each of these claims is believed patentable based on additional novel matter contained therein. Accordingly, reconsideration and withdrawal of the rejection of Claims 2-7, 9-11, 25, and 28 is respectfully requested.

Rejections Under 35 U.S.C. § 103(a)

Claims 6 and 7 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Bortz (US 5,646,076)) in further view of Suzuki (US 5,823,314).

First, with respect to the Suzuki and as stated in the Amendment of June 12, 2000, the Applicants respectfully submit that Suzuki is not prior art. Thus, Suzuki, should be removed as a basis for rejection of the claims. Suzuki is an intervening reference between the U.S. filing date (March 11, 1998) and the priority date (March 25, 1994) of the present application. See the attached copy of the filing receipt showing priority to French Patent Application 94 03518 and a priority date of March 25, 1994. Therefore, Suzuki does not qualify as prior art under 35 U.S.C. § 102 and can not be a basis for rejection of the claims of the application.

Secondly, as discussed above, Bortz does not teach or suggest the Applicants' claimed invention, which recites a specific relation between the weight of the non-woven fibre mat and the weight of impregnating thermosetting resin comprising a friction material. Accordingly, the cited references do not disclose or suggest the invention of Applicants' Claim 1. As rejected Claims 6 and 7 depend directly or indirectly from independent Claim 1 and thus, include all of the limitations of Claim 1, the Applicants respectfully submit that Claims 6 and 7 are also patentable over the Bortz patent for the above-stated reasons. Reconsideration and withdrawal of the rejection of claims 6 and 7 are respectfully requested.

New Claims

Claims 33-39 have been added to claim preferred embodiments of the Applicants' invention. These claims recite with particularity the friction material disclosed by the Applicants in the Specification at p. 7-8. Accordingly, no new matter is added to the application by the addition of these claims. Further, the references cited in the rejection of Applicants' claims fails to provide teaching or suggestion for the embodiments disclosed and claimed by the these new claims. Therefore, the Applicants respectfully submit that these claims are patentable over the cited references and respectfully solicit allowance of the claims.

Conclusion

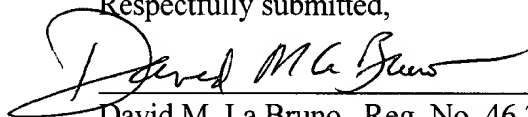
Based on the foregoing remarks, it is respectfully submitted that all the claims as currently pending are patentable and in condition for allowance. Reconsideration of the application and withdrawal of the rejections are respectfully requested.

In the event that a telephone conference would facilitate examination in any way, the Examiner is invited to contact the undersigned representative at the number provided.

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MARKED CLAIMS TO SHOW CHANGES MADE

1. (Three Times Amended) A friction material designed for fitting to a device employing friction in a liquid medium, the friction material comprising approximately 20% to 40% by weight a mat of non-woven fibres [impregnated with] and approximately 40% to 60% by weight a thermosetting resin which impregnates said fibres, wherein said fibres have a length of at least 12 mm[, and wherein the thermosetting resin includes a polar solvent].
2. A friction material according to Claim 1, wherein the average length of the fibres is at most 120 mm.
3. A friction material according to Claim 2, wherein the fibres are chosen from the group consisting of glass, wool, cotton, ceramic, polyacrylonitrile, preoxidized polyacrylonitrile and aramid.
4. A friction material according to Claim 3, wherein fillers in powder form are incorporated into the mat.
5. A friction material according to Claim 4, wherein said fillers in powder form are selected from the group consisting of copper, rockwool, carbon, zirconium silicate, iron sulphide, alumina, rubber and diatoms.
6. A friction material according to Claim 4, wherein fillers in the form of pulps are incorporated into the mat.
7. A friction material according to Claim 6, wherein said pulps are selected from the group consisting of the pulps of glass, aramid, acrylic and phenolic fibres.
9. (Two Times Amended) A friction material according to Claim [8]1, wherein the thermosetting resin is resol-based.

10. (Two Times Amended) A friction material according to Claim [8]1, wherein latex is added to the thermosetting resin.

11. (Three Times Amended) A friction material according to Claim [4]1, wherein fillers in powder form are incorporated into the thermosetting resin, wherein said fillers in powder form are selected from the group consisting of copper, rockwool, carbon, zirconium silicate, iron sulphide, alumina, rubber and diatoms.

25. A friction material according to Claim 5, wherein fillers in the form of pulps are incorporated into the mat.

28. (Amended) A friction material according to Claim [8]1, wherein the polar solvent is an aqueous polar solvent.

33. (New) A friction material for a device employing friction in a liquid medium, the friction material comprising a mat of non-woven fibres impregnated with a thermosetting resin, wherein the friction material comprises by weight

approximately 20% to 40% fibres selected from the group consisting of glass, wool, cotton, ceramic, polyacrylonitrile, preoxidized polyacrylonitrile and aramid; and

approximately 40% to 60% thermosetting resin selected from the group consisting of water-based resins, resol-based resins, phenolic plastic resins, aminoaldehyde resins, epoxy resins and polyimide resins.

34. (New) The friction material according to Claim 33 wherein the fibres have an average length of between approximately 12 mm and 120 mm.

35. (New) The friction material according to Claim 33 that is by weight approximately 20% glass fibres, 10% ceramic fibres, 10% polyacrylonitrile fibres, and 60% water-based resin.

36. (New) The friction material according to Claim 33 that is by weight approximately 30%

cotton fibres, 10% ceramic fibres, and 60% water-based resin.

37. (New) The friction material according to Claim 33 wherein the mat further includes fillers selected from the group consisting of copper, rockwool, carbon, zirconium silicate, iron sulphide, alumina, rubber, diatoms, glass, aramid, acrylic and phenolic fibres.

38. (New) The friction material according to Claim 37 that is by weight approximately 20% glass fibres, 10% ceramic fibres, 10% polyacrylonitrile fibres, 10% carbon, 10% coke, and 40% resol-based resin.

39. (New) The friction material according to Claim 37 that is by weight approximately 20% glass fibres, 10% ceramic fibres, 10% polyacrylonitrile fibres, 10% copper, 10% rockwool, and 40% resol-based resin.